

**PEORIA RIVERFRONT DEVELOPMENT  
(ECOSYSTEM RESTORATION) STUDY, ILLINOIS**

**FEASIBILITY REPORT WITH INTEGRATED  
ENVIRONMENTAL ASSESSMENT**

**APPENDIX I  
PROJECT PERFORMANCE ASSESSMENT AND MONITORING PLAN**

**CONTENTS**

<b>Subject</b>	<b>Page</b>
INTRODUCTION .....	I-1
MONITORING PLAN.....	I-1
SAMPLING METHODS.....	I-1
Fish.....	I-1
Mussels .....	I-3
Macroinvertebrates.....	I-4
Waterfowl .....	I-4

**Tables**

<b>No.</b>	<b>Title</b>	<b>Page</b>
I-1	Monitoring and Performance Evaluation Matrix .....	I-5
I-2	Physical and Chemical Monitoring and Data Collection Summary .....	I-6
I-3	Natural Resources Monitoring and Data Collection Summary.....	I-7
I-4	Post-Construction Evaluation Plan .....	I-8

**Figures**

<b>No.</b>	<b>Title</b>	<b>Page</b>
I-1	IWW Peoria Pool, Peoria Lake Fish and Mussel Survey .....	I-2

**PEORIA RIVERFRONT DEVELOPMENT  
(ECOSYSTEM RESTORATION) STUDY, ILLINOIS**

**FEASIBILITY REPORT WITH INTEGRATED  
ENVIRONMENTAL ASSESSMENT**

**APPENDIX I  
PROJECT PERFORMANCE ASSESSMENT AND MONITORING PLAN**

**INTRODUCTION**

To ensure that the selected project performs as designed, the project will be intensively monitored for the first 5 years. The project will be monitored yearly for selected physical, chemical, and biological parameters (see Tables I-2 and I-3). For the next 10 years, the project will be monitored every 3 years. For years 16 to 25, the project will be sampled every 5 years. Every 5 years, a Post-Construction Evaluation report will be prepared that will document the data collected and the project performance to date.

**MONITORING PLAN**

A sampling plan for fish and waterfowl was proposed and conducted in the summer of 2000 and data was used for "Without Project" analyses in conjunction with the WHAG/MOFISH. The purpose of the sampling effort was to document the present state of the fishery, mussel, benthos and waterfowl use of lower Peoria Lake, but more importantly, set the stage for subsequent sampling after project completion that will document biological gains made as a result of habitat improvement. While no aquatic vegetation exists now, if in the future, such parameters are warranted, notes will be made quantifying the presence of aquatic vegetation in the study area. It should be noted that the sampling plan devised here is general in nature because the island configurations were not final at the time sampling was performed. However, the general design and sampling locations can be determined now, and then at a later date the sampling regimes can be altered to fit the island configurations.

The sampling area is delineated by a comprehensive construction design and encompasses two general areas in Lower Peoria Lake. Sampling will be conducted in two areas, one above McClugage Bridge and one area below the bridge. The area above the bridge will be designated Station 166 which coincides with the River Mile at that location and the area below the bridge will be designated as Station 165.

**SAMPLING METHODS**

**FISH**

Fish will be sampled using a variety of gear in order to document the widest assemblage of the fisheries in the sampling area. Fish will be sampled in both locations in Lower Peoria Lake (Figure I-1). One area above McClugage Bridge, Station 166 and one below at Station 165.

**Figure I-1**

### **Electrofishing**

Sampling is normally conducted using an 18-foot aluminum plate boat fitted with a 5.0-GPP Electrofishing unit. Two anode booms will be employed using the hull of the boat as an anode. A 9 hp motor will run a generator with an output power of 5,000 watts and 16 amps. Electrofishing will be conducted at each location for approximately one hour. The route of the sample will be determined by the shape of the islands and the sampling time proposed should be adequate to cover the entire shoreline of the island(s).

### **Trap Nets**

Standard trap nets will be used which consists of two 4' x 6' frames, double throated, with five hoops made with 1 3/4" bar mesh. The trap nets have 50-foot leads. Two nets, with leads tied end to end will be set parallel to the line of the islands. Two such devices will be set at each location, designated as A and B, and will be set in the afternoon of day 1 and picked up the following day, usually 16-20 hours.

### **Gill Nets**

Standard gill net sets will be employed at one location for each station. Nets have a solid core float line and solid core lead line and have the following dimensions: 125' length x 6' depth and consists of five 25' panels composed of 3/4, 1, 1-1/2, 2, 2-1/2 inch mesh, bar measure. Due to the large numbers of gizzard shad, nets will be set before sampling on day 2 and retrieved after all other sampling is completed, usually 2 to 4 hours.

### **Minnow Seines**

Sampling will be accomplished using the standard 30' x 6' seine having a 0.25" mesh with 6' x 6' bag located in the center of the net. Seines will be employed at selected sites along the shore of each island.

### **Data Collection**

All fish collected will be identified to species, measured for total length (mm) and weighed to the nearest gram. Depending on the size of the collection, catches will be reported as catch per unit effort, or the number per one hour of sampling. All fish will be returned to the River immediately upon processing, except for minnow seine collections which will be preserved in 10% formalin and returned to the lab for processing. Sampling can commence after completion of the project and it is anticipated that these stations will be included in the normal annual monitoring routine of the Illinois River. However, additional sampling will be done in autumn and winter to document the use of the deepwater habitats by fish. This type of sampling will be accomplished as river conditions permit.

### **MUSSELS**

Mussels will be collected by a combination of two methods. The first technique will be the use of a crowfoot bar, which will be towed along the bottom on specified transects within the sampling area. If the crowfoot bar is successful in locating mussels, then a more detailed and comprehensive sampling regime will be employed. Transects will be determined based on habitat configuration and stations will be identified and sampled by hand collection with the use of underwater diving. Sampling will probably not be necessary until year-5 due to the slow growth and slow colonization

characteristics of the species involved. Depending on the results of year 5 sampling, mussels will be sampled at 5-year intervals.

### **MACROINVERTEBRATES**

Macroinvertebrate collections will be made at selected sites throughout the construction area based on the final configuration of the islands and extent of the dredging. Collections will be made using a 508 square centimeter Ponar grab sampler. Three replicate samples will be taken at each sampling site. Samples will be washed through a 1.18-mm mesh screen. Organisms will then be picked from the screen, preserved in 10% formalin solution and returned to the lab for identification and enumeration. Remaining material from the screen will be stained with Rose Bengal, preserved in 10% formalin solution and returned to the lab for processing. Subsequent analyses will be dependent upon the number of species and densities of organisms collected. Like mussels, it is anticipated that sampling will not begin until year 5 and then every 5 years thereafter.

### **WATERFOWL**

Waterfowl use of the areas in and around the Peoria Lake area will be collected by means of the historical and ongoing waterfowl flight surveys conducted the Illinois Natural History Survey. Transects and aerial counts are those that have historically been made as part of a Statewide census. These flights are made in the fall and spring to document the use of designated areas by migrating waterfowl.

**TABLE I-1. Monitoring and Performance Evaluation Matrix**

<b>Project Phase</b>	<b>Type of Activity</b>	<b>Purpose</b>	<b>Responsible Agency</b>	<b>Implementing Agency</b>	<b>Funding Source</b>	<b>Implementation Instructions</b>
Pre-Project	Sedimentation Problem Analysis	Define system-wide problem. Evaluate planning assumptions.	Corps	Corps	Corps	--
	Pre-Project Monitoring	Identify and define problems at site. Establish need of proposed project features.	Sponsor	Sponsor	Sponsor	--
	Baseline Monitoring	Establish baseline for performance evaluation.	Corps	Sponsor through Cooperative Agreements, or Corps	Corps/ Sponsor	See Table _____
Design	Data Collection for Design	Include quantification of project objectives, design of project and development of performance evaluation plan.	Corps	Corps	Corps	See Table _____
Construction	Construction Monitoring	Assess construction impacts; assure permit conditions are met.	Corps	Corps	Corps	See State Section 401 Stipulations
Post Construction	Performance Evaluation Monitoring	Determine success of project as related to objectives.	Corps (quantitative) Sponsor (field observations)	Sponsor through O&M, or Corps	Corps/ Sponsor	See Table I-4

**TABLE I-2. Physical and Chemical Monitoring and Data Collection Summary**

Type Measurement	Design Phase		Construction Phase		Years 1 –5		Post-Construction Phase Years 6 -15		Years 16 - 25		Sampling Agency	Remarks
	APR-SEP	OCT-MAR	APR-SEP	OCT-MAR	APR-SEP	OCT-MAR	APR-SEP	OCT-MAR	APR-SEP	OCT-MAR		
<u>Water Quality Stations</u>	2C	2C			2C,Y	2C, Y	2C,3Y	2C,3Y	2C,5Y	2C,5Y	Corps	
Turbidity												
Secchi Disk Transparency												
Dissolved Oxygen												
Specific Conductance												
Water Temperature												
pH												
Chlorophyll												
Total Alkalinity												
Suspended Solids												
<u>Flow Measurements</u>	10				10, Y	10, Y	10, 3Y		10, 5Y		Corps	
Velocity												
Water Depth												
Water Elevation												
<u>Geotechnical Borings</u>											Corps	
Boring Stations					4, Y		4,3Y		4, 5Y			
<u>Sedimentation Transects</u>											Corps	
Sedimentation Transects					20, Y		20,3Y		20,5Y			
Hydrographic Soundings	2				1,Y		1,3Y		1,5Y			
<u>Survey Transects</u>											Corps	
Cross Sections					12, Y		12,3Y		12,5Y			

Legend

C = Continuous

W = Weekly

M = Monthly

Y = Yearly

nC = n-Day Continuous

nW = n-Week Interval

nY = n-Year Interval

1,2,3 = Number of times data are collected within designated project phase

Corps = Corps of Engineers, Rock Island District

IDNR = Illinois Department of Natural Resources

**TABLE I-3. Natural Resources Monitoring and Data Collection Summary**

Type Measurement	Design Phase		Construction Phase		Post-Construction Phase						Sampling Agency	Remarks
	APR-SEP	OCT-MAR	APR-SEP	OCT-MAR	Years 1 –5		Years 6 -15		Years 16 - 25			
					APR-SEP	OCT-MAR	APR-SEP	OCT-MAR	APR-SEP	OCT-MAR		
<u>Point Measurement</u>												
Trap Nets	1				Y		3Y		5Y		IDNR	
Ponar Bottom Sampling	1				Y		3Y		5Y		IDNR	
Minnow Sienes	1				Y		3Y		5Y		IDNR	
<u>Transect Measurements</u>												
Gills Nets	1				Y		3Y		5Y		IDNR	
Mussel Sampling	1				Y		3Y		5Y		IDNR	
Waterfowl Count	1				Y		3Y		5Y		IDNR	
<u>Area Measurements</u>												
Electro Fish Run	1				Y		3Y		5Y		IDNR	
Aerial Waterfowl Survey	1				Y		3Y		5Y		IDNR	

Legend

C = Continuous

W = Weekly

M = Monthly

Y = Yearly

nC = n-Day Continuous

nW = n-Week Interval

nY = n-Year Interval

1,2,3 = Number of times data are collected within designated project phase

Corps = Corps of Engineers, Rock Island District

IDNR = Illinois Department of Natural Resources

TABLE I-4. Post-Construction Evaluation Plan

Enhancement Potential									
Goal	Objective	Enhancement Measure	Unit	Year 0 Without Alternative	Year 1 With Alternative	Year 25 Target With Alternative	Year 50 With Alternative	Feature Measurement	Annual Field Observations by Site Manager
<b>Restore and Protect Backwater Habitat</b>	Create off-channel deepwater areas to provide year-round habitat for fisheries and associated species	Excavate channels in backwater areas	Winter water temperature (°F)	32	34	34	34		
			Water depth (acres > 8 ft)						
			Above bridge	0	53.4	53.4	53.4		
			Below bridge	0	149.9	149.9	149.9		
			Dissolved oxygen mg/L	3.0-5.0	≥ 5.0	≥ 5.0	≥ 5.0	Perform water quality tests at stations listed above	
	Reduce sedimentation in backwaters	Construct flowing side channel between islands below bridge	Current velocity (ft/sec)	<1.0	>1.0	>1.0	>1.0		
		Construct closing structure	Current velocity (cm/sec)	>1.0	0	0	0		